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R E P O R T
of the
SIXTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City
February 24-25, 1961



Reported by
G. F. Sprague, Secretary

Crops Research Division
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REPORT OF THE SIXTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City, New York
February 24 and 25, 1961

MORNING SESSION, FEBRUARY 24

The meeting of the Northeastern Corn Improvement Conference was called to order by Chairman F. Dimmock at 9:15 a. m. This was followed by introductions and a welcome by the Administrative Advisor H. R. Fortmann.

The first order of business was the appointment of a nominating committee consisting of J. C. Anderson (Chairman), H. T. Stinson and D. L. Matthews. This was followed by a series of discussion topics, each topic introduced by a designated leader. The reports of these discussion leaders follows.

Evaluation of the Stalk Rot Project C. W. Boothroyd

Stalk rot of corn has long been a problem in the Northeastern United States and Canada. Considerable time for discussion of this disease has been allotted at almost every meeting of the Northeastern Corn Improvement Conference for the last 10-12 years. In 1958 members of this Conference began a voluntary project on stalk rot, its primary objective being a search for germ plasm for resistance to stalk rot that might be combined in hybrids for general use in the Northeast. The N. E. C. I. C. group selected several inbreds of both resistant and susceptible types in each of two maturity groups, early and late, and made diallelic single crosses within these two groups. Seeds of these corn lines have been planted by cooperating members in Canada and in several states in the Northeast over the past three years. Among observations made on these corn lines have been those of days to mid-silk, grain moisture at harvest, stalk rot severity, and grain yield.

Coincident with this general search for good stalk standability has been another phase of the stalk rot project, a comparison of rot induced by artificial inoculation with that occurring under natural field conditions. This work has been conducted in Canada, in New Jersey, and in

New York with isolates of Gibberella zeae believed to be responsible for much of the stalk rot in the Northeast. In addition, members of the N.E.C.I.C. group working directly or indirectly on stalk rot at their own stations have shared results of their research at the annual regional conferences and elsewhere.

It may be somewhat early now to attempt an evaluation of the results of this Cooperative Stalk Rot Project, but it seems appropriate to review the progress to date in terms of future activity. Eight states (Connecticut, Maine, Massachusetts, Maryland, New Jersey, New York, Pennsylvania and West Virginia) and two stations in Canada, Harrow and Montreal, in the northeastern region have cooperated on the stalk rot project. This past season five cooperators in four states and Canada continued experimentation. Some twelve inbreds and diallelic crosses with these inbreds have been observed in the field over the past two years. Data on days to mid-silk, moisture of grain at harvest, and yield potential have revealed that the majority of the diallelic crosses are adaptable to several localities in the Northeast. However, many of the lines, both inbreds and hybrids, would be too late for much of the same region and a search should be continued for lines adaptable to these areas.

There was considerable difficulty at the start of the project in choosing inbreds for general use because of reported differences in standability of these lines by the different members. However, several inbreds were finally selected that met with the approval of the group. It is interesting that results of the tests to date confirm these previous observations, i.e., corn lines reported to stand well in one locale may stand less well in another. No one inbred or single cross has emerged as a "cure-all" for the stalk rot problem.

Considering the few inbreds used, however, there may be more potential for stalk rot resistance emerging from the program than at first apparent. The inbreds Oh07, Ind. 38-11, Oh43, and Oh26 were quite uniformly resistant to stalk rot in the test areas. Two inbreds selected for susceptibility, Pa54 and Iowa Os420, proved uniformly susceptible in the field. Oh51A, even though quite badly stalk rotted in some instances, had the unusual attribute of apparent transfer of its resistance to single cross hybrids made with it.

Diallelic crosses made with most of the above resistant inbreds seemed to retain the resistance of those inbreds, and susceptibility of Pa54 and Iowa Os420 was carried over into its single cross hybrids. This would suggest that we should be able to predict stalk standability performance of future hybrids with some regularity.

The stalk rot resistance exhibited by inbreds and single crosses added to the project by individual cooperators was encouraging. Inclusion of some of these lines into the project should extend the use of such potential resistant germ plasm in the Northeast. In addition, it seems that we have not begun to exhaust the sources of such germ plasm in inbreds.

The second phase of the Cooperative Stalk Rot Project, that of artificial inoculation as a tool for screening resistant hybrids, has been less than satisfactory. Although in many instances there has been a high correlation between stalk rot induced by artificial inoculation and that occurring naturally, there have been enough contrary data accumulated to indicate, at least for the present, that this phase should not be included in the overall project.

Research on stalk rot carried on independently by N.E.C.I.C. members, has contributed much to the project indirectly. All of the corn breeders, for example, record stalk rot data as a part of their programs and these observations add to the general fund of knowledge about this disease. Several pathologists in the Northeast have been directly involved with research on stalk rot. Their contributions have helped us to understand better the stalk rot problem as it exists in this region.

Good standability is what we're all after, and development of resistance to stalk rot is an important part of this project. Unfortunately, we don't know as much as we'd like to about what causes stalk rot, or exactly how the disease develops. We have not even reached agreement on how to recognize and evaluate the disease in the field.

Each one of us working with corn has his own method of evaluating for standability. My point is that we need more fundamental work on stalk rot as a disease and on the nature of resistance to this disease. We should find out what we are testing for and then how to test for it. I'm not suggesting that we cut down on our Cooperative Stalk Rot Project; on the contrary, I think that it should be expanded. But I would like to see included in the project some research at one or more stations in the Northeast on the basic nature of stalk rot and stalk rot resistance. This work would be of a regional nature and would be coincident with or in addition to any work of this kind now in progress.

Some research of this nature has been done at Connecticut by Stinson, and at New Jersey by Cappellini, and now Peterson. I would like to see this program expanded. Wernham has developed a corn disease nursery at University Park, Pa., and at present there are sources of stalk rot resistant germ plasm available for testing. Advantage should be taken of this material in an effort to shorten our program. Whitney at Harrow,

in Canada has been working on the biochemical nature of resistance but I understand that this program will be curtailed because of a switch to soybean research. We at Cornell have had an active program on stalk rot and will probably continue it. We have worked on artificial inoculation as a possible method of testing for resistance, on the nature of resistance, and at present are focusing our attention on the corn root rhizosphere and ecological relationships as an approach to an understanding of the stalk and root rot complex.

The corn breeders of the N.E.C.I.C. have been most cooperative in the Stalk Rot Project. Anderson of New Jersey has been active in making seed and shipping it to the cooperators. This past season Gorsline at Pennsylvania, and Rothgeb have also made crosses of material to be used in the future. Mortimore has helped with the program at Harrow, and Everett at Ithaca, New York. Everett is at present working with the Rockefeller Institute in Mexico and proposes to send material to New York that will be screened for possible stalk rot resistance potential. Maybe some of this material will have application in the Northeast. Others have cooperated in the past but have found their own programs too full to permit continued participation. The project has expanded even more this past year and many of us are asking ourselves whether we have the time and money to give to it in the future. As a group we should decide whether to continue this project, and if so, to make plans for the future.

I would like to anticipate your reaction, if I may, in order to make some suggestions for future plans. Previous response makes me believe that most of you think that this project is worthwhile and that it should be continued. Some of us will carry on the project this year even though we will have to cut somewhere else in order to give it attention. I would guess that others of you would participate if funds were available to get the necessary help to add this to your programs. Because this project has become so big in scope that it cannot be added to already full schedules, and because it is difficult to cut out projects already in progress, I would suggest that this group think of the possibility of getting funds to support continuation of the project. I would further suggest that maybe our first step might be to investigate the possibility of getting federal funds to support this Regional Stalk Rot Project. Who should get such funds, how support might be divided, and what the responsibilities of cooperating members might be are some of the questions that must be answered. I would leave you with this idea with the hope that a general plan of action might be formulated by the members of this group before completion of this meeting by noon tomorrow.

Some Possibilities for Breeding Hybrids Tolerant
of Dense Plantings

H. T. Stinson

Investigations Dr. Moss and I have conducted during the past two years have demonstrated that the competitive shading in thickly planted corn fields has an important effect on yield performance. At high planting rates differences observed in the grain yields of various hybrids reflect in large measure differences in tolerance to a shade environment, at least when soil moisture and fertility are adequate. Evidence for this conclusion was obtained by growing several single and double cross hybrids known to be either tolerant or intolerant of thick plantings under a cloth shade tent at the relatively low planting rate of 15,000 plants per acre. Comparisons of yield and other characteristics were made between the hybrids growing in shade and in a duplicate planting in full sun.

In terms of yield, the tests pointed out a striking correspondence between tolerance to shade and to dense plantings. In 1959, the average yield for the five varieties intolerant to thick plantings was reduced 40% (range 34-45%) in the shade, whereas the average yield of the six tolerant hybrids was reduced only 20% (range 11-29%), a highly significant differential response. Average yields in the sun for the two groups of hybrids were almost identical. In 1960, the experiment was repeated, using the two most tolerant single cross hybrids (C103 x D14¹ and P334 x C103²) and the two least tolerant single crosses (P158 x C103² and Hy x C103²) from the previous year's test. The level of shade was increased by adding a second layer of cloth to the tent.

Results of the 1960 experiment are given in the accompanying table. In this second test yields in the shade were reduced 86% in the intolerant hybrids, and 50% in the tolerant hybrids. Again the difference in response of tolerant and intolerant hybrids was highly significant. Thus hybrids tolerant of thick plantings are also tolerant of shade, and hybrids intolerant of thick plantings are less tolerant of shade.

It is clear that ear barrenness is largely responsible for the differential yield response in shade. The high incidence of barrenness in the intolerant hybrids is not caused by a failure of ear differentiation, but

¹ Hybrid from E. W. Doubet

² Hybrids from Pioneer Hi-Bred Corn Company

by a retardation of ear and silk growth at the time of flowering. This impeded ear development is expressed primarily as a cessation of silk growth before or very soon after emergence, and to a lesser extent as a delay in silking in relation to tasseling. After harvest, the ear from each plant was compared with the flowering and silk growth data recorded for that plant earlier in the season. The amount of grain produced in almost every instance was easily explained by the silk behavior.

Other characteristics of the tolerant and intolerant hybrids did not provide clues as to the basis of the differential shade response. These results are summarized in the table, and are discussed briefly below:

1) Fodder yield -- In the sun the intolerant hybrids produced more fodder than the tolerant varieties. Fodder yields in the shade were equal, and reduced. The reduction due to shade was significantly greater in the intolerant hybrids.

2) Photosynthesis -- As would be expected from the equal fodder yields in the shade, CO₂ assimilation, measured directly in the field at flowering, was the same in tolerant and intolerant hybrids growing in shade. Rates of photosynthesis at flowering were also identical in the two groups in the sun. The greater fodder yield of intolerant hybrids in the sun is explained by the fact that they remained green longer in September.

3) Lodging and stalk breakage -- After the hurricane of September 12, all plants in the tent were lodged. Few plants were broken, and there was no difference in tolerant and intolerant varieties in this respect.

4) Stalk rot - In our test, resistance to stalk rot was obviously not responsible for the superior yield performance of the tolerant hybrids.

5) Stalk sugar - Sugar content evidently depended upon the presence or absence of an ear. For the four hybrids in our test, high stalk sugar did not appear to be involved in shade tolerance.

In summary, then, the differential yield performance of various hybrids in dense plantings is determined in part by the capacities of the hybrids to tolerate reduced light intensities. Our results to date are largely descriptive, and do not suggest the mechanism responsible

for the differential response to reduced light. Certain factors, however, are seemingly eliminated. Whatever the mechanism, it must have a specific effect on the later stages of ear and silk development.

It is our opinion that hybrids lacking shade tolerance are incapable of producing high yields in thick plantings, even under otherwise optimum growing conditions. Moreover, the property of shade tolerance must be built in, since little can be done to compensate for its absence, other than alterations in spacing so as to allow maximum light penetration.

The cloth shade tent promises to be a useful tool for classifying and selecting breeding material for shade tolerance. Tests are planned to determine whether inbreds can be as easily screened for this character as hybrids with the hope of initiating inheritance studies. The specific effect of shade on the silking process creates a convenient plant marker, thus making it possible to classify lines at flowering. Further, it seems likely that the number of plants needed to make a reliable line classification will be small. Selection for shade tolerance on an individual plant basis will be more difficult. One of the puzzling aspects of the shade response is the fact that two adjacent plants may react quite differently, one being completely barren and the other having a well-filled ear.

It should be noted that the above considerations tend to equate shade tolerance with thick planting tolerance. Obviously, hybrids which maintain a high level of performance at increased planting rates must have attributes other than tolerance to shade, notably good stalk quality and drouth tolerance.

Plants selected in a shade environment may not always possess these additional properties. The relative effectiveness and efficiency of selection in a shade tent vs selection in a thick planting remain to be determined. With respect to drouth tolerance, however, it is interesting that moisture stress conditions during flowering also frequently result in barrenness. Stress conditions of drouth, which result in a lower level of photosynthate in the plant, may be physiologically similar to stress conditions of shade. Shade tolerant hybrids may be capable of channeling larger proportions of available products into ear development under all stress conditions. We plan to study the drouth tolerance of shade tolerant hybrids.

1960 - Comparison of Tolerant and Intolerant Single Crosses
(Results given are averages of two hybrids in each group)

	Intolerant			Tolerant		
	Sun	Shade	% red'n in shade	Sun	Shade	% red'n in shade
Grain (g/plant)	152	21	86	161	80	50
Stover (g/plant)	172	170	1.5	137	115	16
Fodder (g/plant)	324	191	41	298	195	35
Barren plants (%)	5	80	-	1	13	-
Height (in.)	108	123	14(+)	109	125	15(+)
Relative photosynthesis at flowering	98	50	48	100	50	50
Stalk rot (2)	7	0	-	66	55	-
Stalk sugar (refrac.readings)	5.2	12.3	(barren)	3.0	4.2 12.3	(with ears) (barren)

Incorporating Earliness Into Central Corn Belt Lines

R. I. Brawn

Corn breeders on the northern periphery of the Corn Belt look with envious eyes at the array of agronomically superior inbred lines presently in use in the major corn growing areas. "Should it not be possible to convert these inbreds to earlier maturity by introducing genes for earliness and at the same time preserve the essence of their agronomic make-up unchanged?" is an oft repeated question. Or is an inbred such a "delicate balance of genes", as MacKey would describe a cereal variety, that the introduction of genes for earliness would so disrupt the balance that the derived inbred would not retain the superiority of its Corn Belt inbred parent?

A preliminary evaluation of six inbreds derived from four Corn Belt inbreds following the introduction of genes for earliness from Gaspe Flint will constitute this report. It is shown that useful, although not superior, inbreds have been derived by this method which retain a sizeable amount of genetic similarity to their Corn Belt inbred parent.

Previous studies (Henry, V. C. R. A study of the inheritance of earliness in Gaspe Flint and some inbred lines of corn. M.Sc. Thesis. McGill Univ. 1956) had shown that the inheritance of days to 50% silking in Gaspe x WF9 crosses was largely controlled by about 8 gene pairs. This relatively small gene difference suggested that individual genes should have major effects which could easily be detected making their transfer from parent to progeny relatively simple. This proved to be the case in practice.

The six inbreds studied (Q160, Q161, Q162, Q163, Q164, Q165) are each S-6 segregates from a Corn Belt inbred x Gaspe cross. Selection for the plant and ear type of the Corn Belt inbred parent was combined with selection for earliness to give inbreds in the 100-200 maturity range.

One of these inbreds, Q160, is out of inbred Hy. When crossed with inbred Hy the yield was only 59 bushels per acre (see table 1), while it averaged 77 bushels in three topcrosses and 87 bushels in a cross with WF9. Similarly, Q165 out of WF9 produced only 50 bushels in a cross with inbred WF9 while it averaged 72 bushels in three topcrosses and 78 bushels in a cross with inbred Hy. The lower yield of the derived inbred in each case when crossed with its Corn Belt inbred parent indicates the degree of similarity in genetic makeup. Further it will be noted that the average topcross yield of 74 bushels of inbred Hy is only slightly higher than that of 71 bushels for Q160, while the topcross yield of WF9 was 77 bu/a compared with 72 bu/a of its derivative Q165. In both cases, however, the moisture in the ear at harvest was lower by a useful amount. The missing data on the yield of inbreds Hy and WF9 for comparison with Q160 x Hy and Q165 x WF9 crosses could not be obtained because of their late maturity.

The source of the other inbreds is indicated in brackets beside the inbred number in table 1. Less detailed observations were made on their breeding behavior. It will be noted, however, that inbred Q163 looks promising.

Also in table 1, it may be seen that the six new inbreds compared favorably in topcross yield with the standard inbreds CO106, W73A, W59E and W9 in their maturity class. The three double cross controls A.E.S.101, NE144, and D.C.6 (WD x CO107)(CO106 x CO109) were similar in yield and percent moisture to the topcross yield of the best of the derived inbreds.

Only the stalk quality of the new inbreds is inferior to the control inbreds and double crosses. Gaspe Flint has extremely poor stalk quality and likely genes for poor stalk quality were introduced along with earliness genes. However, the Corn Belt inbreds used in this study, with the possible exception of W22, do not have good stalk quality.

This study has pointed out several weaknesses in procedure and choice of material. Continuing studies have shown these susceptible to improvement. In the first instance, to achieve the necessary stalk quality, only the very strongest stalked Corn Belt inbreds should be used since it has been shown here that the inferior stalk quality of Gaspe Flint will weaken the moderate stalk quality of an average inbred. Secondly, it is now known that the earliness genes from Gaspe Flint will come through at least one backcross to the later Corn Belt inbred to provide a satisfactory degree of earliness in inbreds derived from backcross. By adopting these alterations in procedure the prospects of producing early versions of quality Corn Belt inbreds seem good.

TABLE 1. TOPCROSS YIELD OF INBREDS DERIVED FROM GASPE FLINT X CORN BELT INBREDS

IN COMPARISON WITH SOME STANDARD INBREDS.

Male Parent	C0109 x W-D		W103 x CHV3		WH x WJ		Average of (3)		Hy		WF9	
	%H ₂ O Bu/A.	% Up	%H ₂ O Bu/A.	% Up	%H ₂ O Bu/A.	% Up	%H ₂ O Bu/A.	% Up	%H ₂ O Bu/A.	% Up	%H ₂ O Bu/A.	% Up
Hy	31	79	87	34	72	95	31	72	87	32	74	90
Q160 (Hy)	26	80	81	28	66	77	24	68	72	26	71	77
WF9	38	81	99	34	81	96	31	70	94	34	77	96
Q164 (WF9)				26	60	72	25	56	64	25	58	68
Q165 (WF9)	22	77	76	24	69	91	24	69	81	23	72	83
Q161 (W20)	16	60	80	19	57	92	20	52	72	18	56	81
Q162 (W20)	25	69	94	22	59	81	24	65	76	24	64	84
Q163 (W22)	26	72	88	28	74	88	30	72	79	28	73	85
Q1	16	58	78	19	63	76	18	58	68	18	60	74
C0106	19	67	79	31	54	83	21	56	88	24	59	83
W73A	20	73	95	20	69	98	23	58	89	21	67	94
W59E	24	87	82	26	70	82	25	69	78	25	75	81
W9	27	87	88	25	74	85	29	70	79	27	77	84
A.E.S. 101												
N.E. 144												
D.C. 6												

L.S.D. 5%: Bu/A. = 11 Bu.; H₂O = 5%

The Conference was adjourned at 12 noon for luncheon. Dr. L. M. Roberts, Associate Director of the Rockefeller Foundation, spoke on the "Agricultural Programs of the Rockefeller Foundation."

AFTERNOON SESSION, FEBRUARY 24

The Conference reconvened at 2:00 p.m. to complete the discussion topic program.

Silage Studies G. Gorsline

Preliminary experiments to gather data relative to the importance and evaluation of management, ecological, and hybrid effects on yield and quality of corn for silage purposes was started in 1958 by our corn breeding project. A second objective was to gain experience and information as to practical plot size and field technique as well as subsequent handling.

In connection with this later technique, it appears that 1/2000 acre well bordered plots are satisfactory. Extremely high populations are somewhat difficult to plant or to attain and may require overplanting and subsequent thinning in small plot work. Hand harvest and chopping with a transportable small chopper (illustrated in Pa. Agr. Expt. Sta. Progress Report 206, 1959) has seemed satisfactory.

Let us now turn to table 2 giving data from ensilage that will be fed to sheep by Dr. Bratzler of the Pennsylvania Station. Trends in higher dry matter yield, percent dry matter, stalk soluble solids, percent TDN, and TDN yield with advancing maturity are apparent.

Of particular interest is the comparison of normal silage cut on September 14 and plants whose ears had been bagged cut on the same date. Somewhat comparable quality and yield raise questions pertaining to conventional silage quality judgement factors.

Notice also the components of normal silage yield at this time in the comparison of leaves vs. stalks vs. ears. All of this material was ensiled in 4 x 12 foot silos and will be fed and evaluated by Dr. Bratzler.

Table 4 represents 1959 Pennsylvania data which was interpreted as indicating to us that extremely early cutting at population up to 50,000 pts/A. was not very practical. This data suggests that, when cut at silk,

silage reached peak yields at 26,000 pts/A. and did not gain or lose yields as population increased to a limit of 52,000 pts/A. This is in direct contrast to silage cut at the "regular" dent stage which seemed to yield highest at about 26,000 pts/A. but had a decreasing yield as population increased. Trends in percent dry matter and chemical feed analysis are also apparent.

As these 1959 results did not wholly agree with results from at least one other station, a simple extension of the latin-greco square was used in 1960 to compare 5 hybrids, 5 populations, and 5 cutting dates. Of necessity the interactions are compounded in the error which has a small number of degrees of freedom. Gross trends of important effects are discernable, however.

In table 3 increased dry matter yield is uniformly shown with later cutting and with thicker planting. Table 5 indicated that, if an interaction existed, at least the main effects of cutting dates and populations were large and real. As expected the higher populations decreased and the later cutting dates increased percent dry matter.

Of particular interest in table 3 is the root lodging data as affected by population, indicating that extremely high populations were not harvested by machinery. Dr. Washko of the Pennsylvania Station has data confirming this point. Then these hand harvested yields are probably not representative of farmer results. Stalk soluble solids refractometer data indicated that physiological stage of cutting is the most important effect investigated.

The data in table 6 seem to indicate that it is possible to differentiate between hybrids for silage yield. A correlation of maturity (days from planting to mid-silk) and silage yield is similar to that often found for grain yield. In this "500" area, the "600" hybrids did relatively best, while later maturities were at least not superior. Deviations from this regression indicate that breeding and selection for silage yield within a maturity range probably would be possible.

In summary, this limited data indicates real variation for silage yield attributable to:

1. physiological stage of cutting
2. plant density
3. environment
4. hybrid

Extremely high populations may be dangerous as a result of root lodging. The samples on which this data are based will be subjected to chemical feed analysis.

Table 2. Data on corn (Pa. 507) harvested for silage at various stages of development (20,000 plants per acre, Centre Hall, Pa.)

Date	Stage	Days	'Dry matter' 'Yield' 'Tons/A	'% Dry' 'matter' 'reading	'Refracto-' 'meter' 'TDN	'Lbs. TDN' per 'acre	'Crude' 'protein' 'Fiber	'Pct.' 'NFE	'Pct.' 'EE			
July 25	Boot	11 days before silk	1.02	10.2	3.3± .1	65.65	1339	15.32	26.97	46.72	2.60	
Aug. 5	Mid-silk	-----	2.17	15.1	7.3± .7	65.49	2842	13.86	26.62	51.24	2.64	
Aug. 25	Early milk	20 days after silk	2.89	20.7	9.8± .5	65.12	3764	8.03	24.98	61.50	1.68	
Sept. 14	Dent	40 days after silk	4.37	26.5	6.4± 1.1	70.40	6153	8.78	20.43	64.23	2.84	
Oct. 4	Dry	60 days after silk	5.95	38.0	6.5± 1.0	73.91	8795	8.91	17.27	66.68	3.81	
Sept. 14	♂ sterile - ears covered		3.90	27.0	12.3± 1.9	69.87	5450	9.24	21.06	64.92	1.10	
Percent of yield												
Sept. 15	Leaves	17.2	.71	28.3	----	67.65	961	16.6	13.00	24.36	50.56	3.00
Sept. 16	Ears & husks	52.2	2.15	36.5	----	79.89	3435	59.4	9.14	11.90	73.23	3.91
Sept. 16	Stalks	30.6	1.26	19.6	----	54.89	1383	24.0	4.18	33.00	57.94	.93

Table 3. A comparison of hybrids, populations and harvest date for silage grown at Centre Hall, Pa., in 1960.

Factor	'Dry matter' % 'yield 'Tons/A	Dry 'matter '1st value	'Refracto- 'meter 'reading	'% Root 'lodged 'badly 7/20	'Days to 'mid-silk
<u>Hybrids</u>					
Pa 290	5.50	32.5	8.6	56	71.2
Pa 475	5.60	32.4	7.0	31	73.6
Pa 602A	5.62	26.3	6.6	41	77.0
US 13	5.64	22.5	5.6	20	83.4
Dixie 29	5.72	22.6	6.7	41	90.0
Sig.	NS	*	NS	NS	**
<u>Populations</u>					
12,000 pts/A	4.42	28.6	6.6	0	78.0
24,000	5.04	31.3	4.7	3	78.8
48,000	5.62	27.7	8.1	26	78.8
96,000	5.54	26.0	7.2	60	79.0
192,000	7.46	22.7	7.9	100	80.6
Sig.	**	NS	NS	**	*
<u>Cutting Date</u>					
7/20	2.88	12.3	3.0	40	79.2
8/10	5.72	21.2	7.1	21	79.0
9/1	5.90	26.5	7.2	55	78.8
9/20	6.32	33.1	8.1	23	78.8
10/10	7.26	43.2	9.1	50	79.4
Sig.	**	**	**	NS	NS

Table 4. A comparison of populations and harvest dates for silage at Centre Hall, Pa. in 1959.
(Means for 3 hybrids, Pa 444, Pa 602, and US 13)

Factor	'Dry matter' yield ' ton/A	'Percent' dry ' matter'	'TDN/A' lbs.	'Percent' TDN	'crude' protein	'Percent' crude 'fiber'	'NFE'	'Percent' EE	'Percent' Ash
<u>Cut at Mid-silk</u>									
17,400 pts/A	2.4	18.6	3286	70.0	11.2	24.6	50.7	1.4	5.6
26,100	2.8	17.1	3898	69.9	10.7	25.5	50.2	1.4	5.6
34,800	2.7	16.8	3771	70.2	10.3	26.0	50.4	1.5	5.8
43,600	2.7	16.5	3802	69.6	11.0	26.4	48.6	1.6	6.0
52,300	2.7	16.4	3831	69.6	11.3	26.4	48.2	1.6	6.2
Mean	2.7	17.1	3718	69.8	10.9	25.8	49.6	1.5	5.8
<u>Cut at Dent</u>									
17,400 pts/A	5.0	31.8	7244	71.7	8.2	19.4	59.0	2.6	4.2
26,100	5.2	29.8	7520	71.9	8.4	20.6	58.4	2.4	4.3
34,800	4.9	28.7	6977	71.1	8.1	20.9	57.8	2.1	5.1
43,600	4.7	27.3	6624	70.9	8.2	22.5	56.0	2.0	5.3
52,300	4.4	24.9	6187	70.6	8.8	22.6	55.3	1.7	5.6
Mean	4.8	28.5	6911	71.3	8.3	21.2	57.3	2.2	4.9
L.S.D. Stage of cutting									
	0.1	0.6	297	0.3	0.3	0.7	0.9	0.1	0.3
L.S.D. population									
	0.2	0.9	315	0.3	0.2	0.5	0.8	0.1	0.3

Table 5. Performance of 5 hybrids at 5 populations harvested at Centre Hall, Pa., at varying period from silk in 1960.

Days from silk to harvest	Dry matter yield (tons/A)					Percent dry matter				
	12	24	48	96	192	12	24	48	96	192
		X	1,000	pts/A			X	1,000	pts/A	
-30 to -20		1.9				12.8				
-19 to -10			2.5	3.8				11.3	11.8	
- 9 to 0	2.4				4.8	17.9				13.2
1 to 10		5.0	5.4			19.6	21.6			
11 to 20				5.9	9.1				20.2	21.6
21 to 30					7.2					20.0
31 to 40	4.4	5.7	6.9			27.3	34.5	27.4		
41 to 50				6.2	7.0				24.9	26.9
51 to 60	5.5	5.1			9.2	43.3	45.5			31.9
61 to 70	7.3	7.5				36.7	44.1			
71 to 80			6.4	5.9				50.8	52.7	
Average	4.4	5.0	5.6	5.5	7.5	28.6	31.3	27.7	26.0	22.7

Table 6. Performance data recorded on 29 commercial hybrids (20,000 pts/A) cut for silage at 40% (approx.) grain moisture at Centre Hall, Pa. in 1960.

Hybrid	Dry 'matter 'yield 'tons/A	'Percent ' dry ' matter	'Refracto- ' meter 'reading	' Days to ' mid-silk	' 55° Base ' heat units ' silk to ' cut
Minn. 803	5.1	44.6	4.6	66.7	714
Pa 215	4.6	31.5	4.7	67.3	714
Pa 290	5.5	43.9	6.4	68.3	748
Wis 335A	5.8	35.1	8.1	70.7	705
MS 250	5.9	34.9	8.4	71.0	705
Pa 444	5.9	36.9	6.8	71.3	705
Cor M4	6.0	36.1	8.0	72.0	689
Pa 475	5.6	35.2	8.3	72.3	689
Pa 333	4.8	36.7	9.1	72.3	689
Pa 555	6.4	31.1	7.8	74.3	688
Pa 511	5.7	30.3	6.3	74.3	688
Pa 507	6.3	29.7	9.8	74.7	670
Pa 603	6.5	34.1	4.9	75.7	718
Pa 711	6.1	37.5	4.6	75.7	754*
Oh M15	6.0	29.8	4.8	76.0	652
Oh W64	7.0	33.7	4.3	76.3	754*
Pa 602A	6.9	31.9	7.5	77.0	706
Pa 612	6.2	32.2	7.7	77.3	742*
Pa 602	7.2	30.2	4.2	77.7	687
Pa 820	6.6	34.9	4.3	79.7	698
Pa 807	6.6	34.1	8.6	80.3	698
Pa 840	6.9	34.3	6.8	81.7	665
Conn.870	7.1	33.2	8.6	82.0	665
Pa 850	7.0	36.0	5.8	82.0	665
US 13	6.6	32.3	7.3	82.3	665
Pa 811	6.5	36.3	5.5	82.3	665
Ill.513 _{Br2}	5.8	34.7	5.9	83.3	647
ES 602 _{Br2}	5.3	34.4	6.9	83.3	647
NE 912	7.1	32.7	9.7	87.0	579
Mean	6.2	34.4	6.7	75.9	690
5% L.S.D.	1.0	3.8	3.5	1.2	---

* Harvested same day after cold period

r (Yield-silk) = + 0.815

Corn Silage Project

West Virginia University Agricultural Experiment Station is conducting an extensive forage evaluation program with numerous agronomic species of grasses and legumes. Dried (hay) and fresh samples of many of these have been and are being evaluated by means of the artificial rumen technique developed by researchers here, and also by feeding trials with sheep and by direct chemical analysis. Much valuable information has been obtained, part of which is published. However, much of the work is not yet published.

During the past year a limited study was undertaken to evaluate four corn hybrids for quantity and quality of silage. The following lines were tested - W.Va. B-25; W.Va. 7802; N.J. 8 and N.J. 9. These hybrids were harvested at the optimum stage for silage production, yields were measured and the forage ensilaged. After the forage was properly fermented or "cured" duplicate samples of each were analyzed directly and by means of the artificial rumen technique. Pertinent information obtained on a dry matter (moisture free percent) and an actual (as fed percent) basis was: Moisture, Crude Protein, Estimated Digestible Protein, Digestible Energy (In Vitro), Digestible Energy (Analysis), and Estimated TDN. On this basis the lines were ranked according to the scale used by Penn State in evaluating a forage. According to this scale the silage of N.J. 8 and W.Va. 7802 ranked as good, that of N.J. 9 as good-excellent and that of W.Va. B-25 as excellent.

Plans are being made to expand the corn silage evaluation program this year to include additional hybrids and actual feeding trials with sheep in addition to the direct analysis and the artificial rumen technique.

Silage
Clifford E. Manchester

In 1960 Eastern States Farmers' Exchange conducted silage trials on six 300-400 maturity hybrids and six 500-600 maturity hybrids. These consisted of 4 replicates of 1/2000 acre each. Population level was 16,000 plants per acre and plant were all cut on the same day at an average of 42 percent moisture in the ears.

Due to unforeseen variation in soil conditions the 300-400 test was abandoned. In the 500-600 test ES508 held a slight edge for the second year in dry matter production per acre as compared to Pa602A, Ohio M15 and ES615.

Further attempts were made to adopt a practical method for evaluating hybrids for silage use. Since ears are the most important component of silage it was decided to obtain only total ear weight and fodder weight of each plot at harvest and again after drying to constant weight. This method will be used in further silage tests in 1961.

The conference ADJOURNED at 4:00 p. m. to permit meetings of the several standing committees.

MORNING SESSION, FEBRUARY 25

The conference was called to order at 9:00 a.m. by Chairman F. Dimmock who called for the reports of the standing committees.

REPORT OF THE COMMITTEE ON REGISTRATION OF N. E. HYBRIDS

The members of this committee wish to report that no hybrids were submitted to them for N. E. Registration during the last year.

C. Reed Funk
R. G. Rothgeb
D. F. Jones, Chairman

REPORT OF THE COMMITTEE ON THE UNIFORM TESTS OF 100-200 MATURITY

A third year of tests for five 100-200 maturity hybrids was conducted at six locations. The data are presented in table 7. Based on available data, it is the committees recommendation that none of these hybrids be considered for a NE designation.

The committee suggests that another group of 100-200 maturity single crosses be made up for cooperative testing. Pennsylvania will make up the crosses in 1961. With the acceptance of this report, the committee chairman will solicit members of the conference for recommendations on lines to be included.

F. Dimmock
R. I. Brawn
W. I. Thomas, Chairman

Table 7. Performance records on five experimental and seven standard double crosses (100-200 maturity) compared in 1960.

	MacDonald College Quebec	Pennsylvania State Univ.	Cornell University	University ³ of Maine	E.S.F.E. Mass.	Ottawa, Ont.	Average	Broken Stalks
	Bu/acre % H ₂ O	Bu/acre % H ₂ O	Bu/acre % H ₂ O	Bu/acre % H ₂ O	Bu/acre % H ₂ O	Bu/acre % H ₂ O	Bu/acre % H ₂ O	
DC1 (WDxCollo)(ColllxCol09)	90	88	98	97	104	94	95	8
DC3 (WDxColll)(ColloxxCol09)	87	91	97	94	83	91	91	7
DC5 (WDxCol06)(ColloxxW59E)	88	80	113	97	92	90	93	7
DC6 (WDxCol07)(ColloxxCol09)	87	75	98	89	100	90	90	10
DC9 (WDxW59E)(ColllxxCol09)	85	87	104	101	90	87	92	13
AE5101	79		72	84	62	71	74	
NE144	85	94		95	88	89	90	3
AE5201			99	84		83	89	
Pa215	88	86	109	102	114	85	103	7
Pa290	95	105	117	100	110	89	103	6
Wis6270			89	43		79	84	
MS250		97		87	103	35	96	
LSI @ 5% level		7	16.6	12.2	27			

¹Average broken stalks, Maine, Mass., Ottawa and Pennsylvania.

²Data analyzed by Duncan's Multiple Range Test.

³% H₂O obtained by drying 3 inch sections from 10 random ears of each replicate.

REPORT OF THE COMMITTEE ON THE UNIFORM TESTS OF 300-500 MATURITY

Twenty-five inbred lines were crossed with 2 double-cross testers, Cornell M4 and NE420. The top-crosses were grown at 5 locations. The data are presented in tables 8 and 9.

The committee recommends that 16 of the lines involved be combined in a diallel series in 1961 for cooperative testing in 1962. The seed will be produced by Pennsylvania. The lines chosen for the diallel series are:

<u>Lines</u>	<u>Origin</u>
Cl53	W153R
ES x 55-157	
ES 191-71	
NY821	
NY D16	
NY D62	
NY D410	
Oh26	Clarage
Pa. 37	(Pa.11 x Oh51)(W9 x M13)
Pa. 41	(Pa32 x W22)
Pa. 55	Lancaster Sure Crop
Pa. 409	Oh26A x Pa B8A
Pa. 423	Switzgable
Pa. B8B	B8
W37A	(W25 x A37 ¹ / ₄)
W182D	(WD x W22 ² / ₂)

The breeders whose lines are involved are requested to supply Pennsylvania with 400 kernels of each line for single cross production purposes. Thought should be given to possible nominations for top-cross evaluations in 1963. The individuals and stations involved in the 1959 seed production and 1960 top-cross trials are sincerely thanked by the committee.

C. E. Manchester
H. M. Yegian
G. W. Gorsline, Chairman

Table 8. Summary of performance of 25 inbreds topcrossed to Cornell M4 (300-500 maturity) and grown at five locations in 1960.

	Grain Moisture at Harvest						Grain Yield (15% sh'l)						% Broken Stalks					
	Av.	Penna.		M.S.		Mass.	Av.	Penna.		M.S.		Mass.	Av.	Penn.		MS	Mass.	
		G.H.	Bl.	F.H.	Am.			G.H.	Bl.	F.H.	Am.			CH	Bl		FH	Am
Tester	23.3	22.0	21.0	22.7	19.4	31.3	98	109	108	84	106	85	13	4	17	18	10	16
NY D16	19.8	20.0	17.3	19.9	17.8	23.9	94	107	104	77	98	86	8	12	8	4	3	13
W 33	20.3*	18.5	18.0	-	18.2	-	79*	100	91	-	82	-	8*	4	13	-	7	-
A 509	21.0	19.0	18.3	21.8	18.4	27.4	87	104	108	52	96	73	7	6	7	10	3	7
ND 203	21.3	19.3	19.2	21.7	19.4	26.7	96	119	110	46	118	89	18	23	40	6	3	18
W 182B	21.7	21.2	18.1	21.4	18.3	29.5	100	119	115	84	98	86	7	12	6	5	7	3
ES 191-71	22.6*	22.1	19.2	21.4	21.0	-	97*	116	112	71	100	-	8*	2	7	4	17	-
G 153	22.7	22.4	20.4	21.6	21.0	28.0	102	119	104	79	118	91	7	0	13	3	3	18
Pa 32	23.1*	23.0	19.1	-	21.2	-	99*	115	118	-	101	-	8*	2	4	-	13	-
ES X55-157	23.3*	23.6	19.6	21.8	22.2	-	123*	127	139	102	135	-	6*	2	8	5	7	-
Pa 172A	23.5*	24.1	19.6	-	-	30.0	108*	117	127	-	-	96	10*	8	6	-	-	12
Pa 41	23.9	22.4	21.3	23.4	21.5	30.9	107	123	106	84	120	101	4	2	4	6	0	8
W 37A	24.0	24.9	20.5	21.8	21.4	31.2	108	119	122	85	114	98	7	4	2	13	7	8
Pa 55	24.1	23.0	21.4	24.5	21.5	30.3	116	124	146	92	124	96	15	10	15	12	7	32
W 182D	24.1	26.0	20.8	24.1	21.0	28.5	108	118	129	86	112	94	4	2	2	4	10	0
Pa 407	24.2	22.6	20.9	23.8	20.8	32.7	99	108	117	82	106	82	5	6	2	4	3	8
NY 709-2	24.2	24.2	21.8	23.5	21.4	29.9	97	116	94	77	110	87	6	2	10	2	7	10
W 153R	24.3	25.0	21.1	23.9	22.6	29.0	107	119	124	84	118	88	4	0	11	1	3	5
ES 191-34A	24.4*	23.3	21.0	25.0	21.5	-	104*	100	129	80	120	-	13*	19	9	13	7	-
NY 697-1	24.6	24.4	21.3	22.4	22.6	32.5	115	123	134	91	126	102	8	4	12	10	7	5
NY 821C16	24.9	25.6	22.3	22.8	23.2	30.7	116	116	133	88	140	102	11	4	17	19	0	13
NY 703-1	25.2	24.6	21.9	24.2	22.6	32.6	82	94	93	66	87	68	3	2	1	4	7	3
Pa 406	26.0*	27.4	22.6	-	22.6	32.3	100*	114	116	-	99	94	9*	0	12	-	3	22
Pa 403	26.4	25.9	22.5	24.2	23.0	36.6	111	108	144	88	123	94	7	10	6	7	7	6
A 374	27.2	26.3	24.4	24.2	25.7	35.5	121	126	144	88	136	112	1	2	0	2	3	0
Average	23.7	23.2	20.5	22.9	21.2	30.5	103	114	119	80	112	91	8	6	9	7	6	10
LSD (5%)		2.3	2.3	1.6				16	13	8				1	1			

Centre Hall, Pa.; Bloomsburg, Pa.; Ingham County, Michigan; Feeding Hills, Mass.;
and Amherst, Mass.

* - Mean values adjusted for missing data.

Table 8. (cont'd.)

	% Smut	% Strong Stalks		% Root Lodg.		Days to Mid-Silk			% Ears	% Ear Barren	% Ear Ht.	Pt. Ht.	Ear Ht.	
	<u>Pa</u> <u>Hl</u>	<u>X̄</u> <u>av</u>	<u>Penn.</u> <u>CH</u> <u>Hl</u>	<u>MS</u>	<u>Mass</u> <u>FH</u>	<u>X̄</u> <u>av</u>	<u>Pa</u> <u>CH</u>	<u>Mass</u> <u>FH</u>	<u>Feeding Hills, Mass.</u>					
Tester	6	50	60	41	2	0	73	71	76	100	0	50	74	37
NY D16	4	31	35	27	1	0	74	71	77	100	0	54	74	40
W 33	8	58	62	54	-	0	70	67	73	100	0	56	68	38
A 509	2	34	24	44	1	0	68	66	71	113	0	59	58	34
ND 203	4	44	60	27	1	0	70	66	73	100	0	59	74	44
W 182B	10	54	59	50	0	0	74	71	77	100	3	49	70	34
ES 191-71	2	66	67	64	0	0	70	68	72	97	3	50	64	32
C 153	10	66	91	42	0	0	73	69	77	107	0	54	78	42
Pa 32	0	75	84	66	-	0	72	72	72	100	0	50	72	36
ES X55-157	2	76	85	67	1	3	75	70	79	103	0	61	76	46
Pa 172A	10	72	76	68	-	0	75*	72	-	-	-	-	-	-
Pa 41	6	46	56	35	0	0	75	72	78	100	0	56	78	44
W 37A	4	74	73	75	2	0	74	72	76	100	0	50	76	38
Pa 55	8	55	63	47	3	7	74	72	77	113	0	58	80	46
W 182D	8	83	80	86	0	0	75	72	78	117	0	49	74	36
Pa 407	2	61	64	58	0	0	74	72	77	100	0	44	54	24
NY 709-2	6	41	74	8	0	0	70	68	73	100	0	47	64	30
W 153R	8	73	94	52	0	0	74	71	77	103	0	51	70	36
ES 191-34A	10	40	38	42	1	0	76	73	78	103	0	55	84	46
NY 697-1	0	49	53	45	0	0	75	72	78	100	0	53	76	40
NY 821C16	2	48	67	28	1	0	74	71	77	113	0	54	74	40
NY 703-1	10	84	90	77	0	0	70	68	73	97	3	52	66	34
Pa 406	15	70	87	52	-	0	75	72	77	100	0	48	62	30
Pa 403	0	59	45	73	0	0	75	73	76	100	0	45	80	36
A 374	8	82	88	77	0	0	76	72	79	100	0	40	80	32
Average	6	60	67	52	.5	.4	73	70	76	103	.4	51	72	37
LSD (5%)	1	3	6	6			2							

Centre Hall, Pa.; Bloomsburg, Pa.; Ingham County, Michigan; Feeding Hill, Mass.; and Amherst, Mass.

* - Mean values adjusted for missing data.

Table 9. Summary of performance of 25 inbreds topcrossed to NE 420 (300-500 maturity) and grown at 5 locations in 1960.

	Grain Moisture at Harvest					Grain Yield (15½ % sh'l)					% Broken Stalks							
	Penna.		M.S.	Mass.		Penn.		M.S.	Mass.		Penn.		MS	Mass.				
Av.	C.H.	Bl.		F.H.	Am.	Av.	C.H.	Bl.		F.H.	Am.	Av.	CH	Bl	FH	Am		
Tester	24.5*	22.1	20.7	-	22.6	-	108*	111	130	-	103	-	9*	1	6	-	10	
NY D62	21.0*	21.7	20.1	22.0	-	22.0	103*	117	125	60	-	103	12*	2	17	11	-	20
Pa B8B	23.1	21.2	21.3	23.6	21.3	28.0	102	106	113	87	112	91	5	0	8	3	3	10
Pa 409	23.2	23.3	21.7	22.2	21.1	27.6	108	122	131	79	108	98	5	0	0	1	13	12
NY D65	23.6	22.0	22.5	24.4	22.2	26.8	93	94	116	69	104	84	9	4	12	7	13	9
Pa 41	23.9	21.7	21.6	23.9	21.4	30.9	120	127	147	96	114	117	5	0	0	10	10	6
Pa 270	23.9	22.5	22.3	24.7	21.2	28.8	99	108	118	72	105	94	4	1	2	6	3	6
Pa B8A	24.1	21.6	21.3	22.4	21.2	34.0	96	104	113	78	104	82	5	1	2	5	3	12
Pa 37	24.4	23.6	21.4	25.0	23.6	28.3	103	112	116	90	108	91	4	0	4	4	0	10
ES 352	24.5	21.4	20.7	24.2	24.6	31.6	104	114	125	68	113	102	16	5	25	30	7	14
Pa 407	24.8	23.4	22.4	23.8	23.8	30.5	108	116	128	87	112	98	12	1	6	12	28	14
Pa 408	25.0	24.0	22.1	24.0	22.4	32.6	100	105	119	72	114	88	4	0	4	3	7	4
Pa 283	25.1	23.4	24.9	25.1	22.8	29.2	113	116	140	78	125	104	5	1	2	11	3	9
Pa 410	25.1	23.2	23.5	25.7	21.9	31.1	105	105	123	87	115	95	4	0	4	1	10	5
Pa 406	25.2	23.5	22.6	24.9	22.8	32.0	102	110	121	76	114	89	11	1	6	17	20	12
Pa 423	25.3	24.2	22.5	25.0	23.8	31.2	115	123	138	89	122	104	3	0	2	8	0	5
R 168	25.5	24.5	21.7	24.0	24.3	33.0	112	120	134	90	122	92	4	0	4	9	0	7
NY D4	22.5*	22.9	22.6	24.7	-	33.6	107*	115	129	71	-	107	27*	4	40	32	-	34
Oh 26	26.1	26.4	23.9	25.6	25.5	28.9	122	126	139	108	130	105	3	0	4	3	3	7
Pa 55	26.2	24.8	22.9	25.6	24.8	32.8	126	124	155	109	115	125	12	3	19	6	10	20
NY D410	26.3	25.2	24.6	24.7	24.4	32.5	116	129	140	81	134	97	5	1	4	12	3	4
Oh 51	26.5	24.0	23.8	25.1	25.1	34.6	117	131	135	76	140	104	8	1	15	14	3	5
Pa 31	27.1	25.8	22.9	26.0	24.8	35.9	125	137	149	110	124	107	2	0	4	4	0	3
A 206	27.1	26.0	23.4	25.1	25.0	36.2	118	120	146	105	120	100	4	1	6	4	0	9
Pa 109	28.7	26.5	27.4	25.9	26.6	37.3	116	121	133	100	113	112	4	1	0	2	7	12
Average	25.1	23.6	22.6	24.5	23.4	31.2	110	117	131	85	116	100	7	1	8	9	7	10
LSD (5%)	1.9	1.6	1.6				11	13	8		8		2	2				

Centre Hall, Pa.; Bloomsburg, Pa.; Ingham County, Michigan; Feeding Hills, Mass.;

* - Mean values adjusted for missing data. Amherst, Mass.

Table 9. (cont'd.)

	% Strut	% Strong Stalks			% Root Lodg.		Days to Mid-Silk			% Ears	% Barren	% Ear Ht.	Pt. Ht.	Ear Ht.
	<u>Pa</u> <u>Bl</u>	<u>Av.</u>	<u>Penn.</u> <u>CH</u> <u>Bl.</u>	<u>MS</u>	<u>Mass</u> <u>FH</u>	<u>Av.</u>	<u>Pa</u> <u>CH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>	<u>Mass</u> <u>FH</u>
Tester	0	62	58 66	-	0	74	71 77	100	0	49	70	34		
NY D62	2	57	69 45	2	-	72*	70 -	-	-	-	-	-	-	-
Pa B8B	2	76	79 72	1	0	74	70 77	103	0	52	80	42		
Pa 409	1	82	87 78	0	0	74	71 77	100	0	49	70	34		
NY D65	5	32	39 24	0	0	71	69 73	100	0	55	66	36		
Pa 41	3	68	67 68	0	0	76	74 77	100	0	51	82	42		
Pa 270	1	68	59 78	0	0	71	69 73	100	0	48	66	32		
Pa B8A	7	82	72 91	0	0	74	70 77	100	0	54	78	42		
Pa 37	0	77	83 71	0	0	74	72 75	100	0	50	80	40		
ES 352	8	18	14 21	4	0	73	70 76	113	0	58	80	46		
Pa 407	3	72	86 57	1	0	72	69 74	107	0	45	66	30		
Pa 408	0	78	88 67	0	0	74	70 77	103	0	45	66	30		
Pa 283	4	55	68 42	0	0	71	69 73	103	0	58	66	38		
Pa 410	3	74	71 76	0	0	73	70 76	100	0	47	72	34		
Pa 406	1	66	64 68	0	0	72	69 75	100	0	44	72	32		
Pa 423	2	75	69 81	0	0	74	73 76	100	0	47	76	36		
R 168	6	66	96 37	0	0	74	72 77	103	0	51	74	38		
NY D4	8	42	37 48	1	-	75*	73 -	-	-	-	-	-		
Oh 26	0	84	96 71	1	0	76	73 78	93	3	55	80	44		
Pa 55	3	52	54 51	0	0	77	74 80	97	3	50	72	36		
NY D410	1	85	80 90	1	0	74	72 76	107	0	50	76	38		
Oh51	9	70	93 48	0	0	76	74 78	103	3	56	82	46		
Pa 31	6	64	71 57	1	0	75	73 77	100	0	48	80	38		
A 206	1	60	62 59	1	0	76	73 78	100	0	56	82	46		
Pa 109	8	76	73 78	0	0	76	73 79	100	3	46	74	34		
Average	3	66	69 62	.5	0	74	71 76	101	.5	51	74	38		
LSD (5%)	1	3	4 4				1							

Centre Hall, Pa.; Bloomsburg, Pa.; Ingham County, Michigan; Feeding Hills, Mass.; and Amherst, Mass.

* - Mean values adjusted for missing data.

REPORT OF THE COMMITTEE ON THE UNIFORM TEST OF 600-700 MATURITY

All combination single crosses of the following nine inbreds were produced by Pennsylvania and Eastern States in 1960: C103, C114, 601E, 603E, J48, Oh51A, Oh43, Pa.83, Pa.881P. Seed of these 36 single crosses is available for cooperative evaluation in 1961. It is suggested that participants plant at least two replicates, adding at least the following four check varieties: Pa.602A, Ohio W64, Pa.711, and Conn. 870.

D. R. Butler
R. Funk
H. T. Stinson
D. L. Matthews, Chairman

REPORT OF THE COMMITTEE ON THE UNIFORM TEST OF 800-900 MATURITY

Topcross seed, using US 13 and Conn. 845 as testers, was produced by Pennsylvania in 1959. One or both of these sets of top-crosses was grown at Pennsylvania, New Jersey, Maryland and Eastern States. The summarized data are reported in tables 10 and 11.

From these two groups the following inbreds were selected for further testing: B37, C103, B14, Oh43, W10, Pa.415, Pa.887P, Pa.419, Pa.91, H49 and Pa.890P. Pennsylvania will produce a diallel series in 1961 for testing in 1962. In addition New Jersey will produce a set of single crosses involving 15 inbred lines crossed to each of 5 inbred testers. The five inbred testers will be B37, B38, B14, C103, and Oh43. The other inbreds will be W10, Pa.415, Pa.887P, Pa.419, Pa.91, H49, Pa.890P, J47, J48, J22, J482-4 eg, J504-1, J504-2, J91-5 and J91-6.

M. W. Johnson
R. G. Rothgeb
J. C. Anderson, Chairman

Table 10. Performance records of top-crosses (800 Maturity) involving U.S. 13 as tester, grown at 2 locations in 1960.

Inbred	Yield			Kernel moisture			Ear 1/ qua- lity	Root Lodging		Pa.
	Av.	N.J.	Pa.	Av.	N.J.	Pa.		Sept.	Nov.	
	bu/A	bu/A	bu/A	%	%	%		2 N.J. %	3 N.J. angle	
B37	142	113	172	23.6	22.8	24.5	1.8	17	30	57
B10	139	93	186	24.4	23.3	25.6	2.2	16	10	50
C103	139	94	184	24.2	23.0	25.4	2.1	7	28	51
Oh43	126	93	159	22.2	20.4	24.1	1.8	11	5	31
B14	124	88	160	21.6	19.4	23.7	2.0	9	20	23
Pa.23	124	96	153	22.2	21.1	23.3	2.0	78	22	70
Oh45	122	90	155	23.1	21.8	24.4	2.1	35	18	62
W10	121	86	155	21.6	20.1	23.2	2.0	48	18	30
R165	121	90	152	22.2	21.6	22.9	2.0	60	30	78
Pa.70	119	86	153	23.1	21.8	24.4	1.7	24	15	64
Oh45A	119	81	157	23.8	21.9	25.7	2.2	78	40	37
A25	118	83	153	22.2	21.6	22.9	2.1	17	14	51
H19	116	85	147	20.9	19.4	22.4	2.0	26	12	42
Pa.421	115	87	142	23.0	21.4	24.6	2.2	37	10	46
H41	114	84	144	23.0	21.8	24.2	2.0	14	18	43
Pa.97	113	82	144	23.8	21.8	25.8	1.8	28	12	43
Pa.422	113	78	148	21.4	21.2	21.5	2.0	24	12	44
H14	112	77	143	23.7	22.5	24.9	2.2	25	10	32
H42	111	82	141	23.0	22.2	23.7	2.3	34	22	72
Pa.420	111	76	146	22.0	19.9	24.0	2.2	64	38	59
R172	110	82	139	21.8	20.1	23.6	2.0	20	10	34
R113	110	80	139	21.4	20.8	21.9	2.4	20	15	35
Msw10	109	79	139	21.9	21.3	22.5	2.2	33	15	61
H45	106	81	131	22.3	21.8	22.8	2.1	19	32	42
Pa.66	105	70	141	20.9	20.6	21.2	2.3	19	12	37
H46	95	66	125	21.5	20.5	22.5	2.0	9	18	43
Oh4c		92			22.1		1.8	40	30	
Pa.62		89			19.6		1.8	0	10	
Pa.88		70			21.8		2.2	23	18	
US 13			149			24.2				36
LSD. @ 5%	10.8			1.5						

1/ 1 best - 5 poorest

Table 10. (cont'd.)

	Broken plants			Strong stalks Pa.	Days to silk Pa.	Leaf blight Pa.	Smut Pa. %
	Pa. N.J.	Av.					
	%	%	%	%			
B37	6	73	40	70	81.0	2.9	4
Bl0	32	91	62	51	84.8	3.1	0
Cl03	10	77	44	75	82.9	2.5	4
Oh43	6	77	42	58	78.4	3.1	6
Bl4	34	61	48	89	81.4	3.9	2
Pa.23	0	84	42	88	74.8	3.9	0
Oh45	4	74	39	44	76.6	3.0	4
Wl0	24	92	58	61	82.1	4.7	15
Rl65	4	83	44	73	79.3	4.5	0
Pa.70	7	93	50	58	79.7	3.0	0
Oh45A	11	80	46	36	80.4	2.7	4
A25	8	88	48	58	81.7	2.8	0
Hl9	12	86	49	64	80.3	3.9	6
Pa.421	7	90	48	35	79.4	2.7	0
H41	17	92	54	24	81.2	2.8	0
Pa.97	10	92	51	63	82.4	2.8	6
Pa.422	24	95	60	44	78.3	4.2	0
Hl4	31	91	61	46	81.8	3.6	0
H42	12	94	53	38	79.4	3.8	0
Pa.420	9	80	44	27	79.8	3.3	2
Rl72	12	80	46	46	81.1	3.4	0
Rl13	16	86	51	42	81.1	3.4	0
MsWl0	20	83	52	44	81.6	3.9	4
H45	8	69	38	78	80.2	3.9	2
Pa.66	25	89	57	15	81.4	3.4	0
H46	16	77	46	33	81.0	3.6	2
Oh4C		80					
Pa.62		95					
Pa.88		92					
US 13	8			31	81.6	3.3	2

Table 11. Performance records of top-crosses (800 maturity) involving Conn. 845 as tester, grown at 3 locations in 1960.

Inbred tested	Yield per Acre			Kernel moisture			ESFE Palmyra, Pa.			
	N.J.	ESFE	Adj.	N.J.	ESFE	Adj.	Ears	Barren	Plant	Ear
	av.	Pa.	Grand	av.	Pa.	Grand	per plant	plants	height	height
	bu.	bu.	bu.	%	%	%	no.	%	inches	inches
Pa. 415	103	174	145	21.4	25.6	24.0	1.00	0	101	54
Pa. 887P	110	165	143	22.2	27.8	25.6	0.93	7	94	51
Pa. 419	91	172	139	23.0	31.4	28.0	1.00	0	94	56
Pa. 886P	92	169	138	23.3	27.3	25.7	1.00	0	102	59
Pa. 91	93	168	138	22.7	30.5	27.4	1.07	0	91	51
CI 317B	85	170	136	21.5	29.8	26.4	1.27	0	112	68
H49	87	167	135	24.1	28.5	26.7	1.00	0	100	57
L317	92	162	134	21.8	27.2	25.0	1.13	0	101	59
Pa. 890P	97	158	134	21.5	27.2	24.9	1.00	7	112	71
Ind. 38-11R	83	167	133	21.5	28.3	25.6	1.14	0	104	62
Oh 7A	92	160	133	21.2	27.8	25.2	1.13	0	87	51
Pa. 92	92	159	132	21.5	26.8	24.7	1.00	0	89	50
Ill. Hy	85	163	132	22.7	27.6	25.6	1.07	0	104	62
Oh 7B	89	161	132	21.5	26.4	24.4	1.00	0	97	54
Pa. 431P	85	162	131	23.4	27.6	25.9	1.00	0	96	55
Pa. 33	94	155	131	21.2	25.8	24.0	1.00	0	93	51
Pa. 418	96	150	129	21.5	24.7	23.4	1.00	0	98	57
Pa. 416	87	155	127	23.3	26.5	25.2	1.00	0	98	58
Oh 41	82	159	128	21.9	28.0	25.6	1.00	0	93	54
CI 42A	84	154	126	22.5	28.2	25.9	1.07	0	98	60
Pa. 57	94	148	126	20.2	22.4	21.5	1.00	0	89	54
CI 38B	81	156	126	23.7	28.2	26.4	1.00	0	99	62
Oh 07	91	149	126	19.9	26.1	23.7	0.93	7	93	52
Pa. 429P	92	146	124	22.2	26.0	24.5	1.00	0	92	56
Pa. 94	91	145	123	19.8	24.6	22.7	1.15	15	92	51
Wf9	90	145	123	21.2	27.1	24.7	1.00	0	92	49
Pa. 93	84	146	121	22.5	25.2	24.1	1.07	0	89	50
Pa. 430P	77	148	120	22.5	26.1	24.7	1.07	0	90	51
Pa. 424P	79	141	116	20.8	23.0	22.1	1.07	0	88	54
Pa. 772	79	139	115	22.2	25.4	24.2	1.00	0	88	55
Pa. 425P	74	138	112	23.7	25.6	24.8	1.00	0	83	46
Pa. 426P	82	130	111	21.9	25.8	24.3	0.93	7	82	48
Pa. 4827P	65	137	108	22.5	27.7	25.6	1.00	0	82	46
Pa. 896P	82	125	108	21.8	25.7	24.1	0.80	20	79	45
Pa. 432P	69	124	102	20.2	26.7	24.1	1.00	0	94	54
Pa. 428P	84			22.6						
Conn. 845		163								
L.S.D. @ 5%			11			1.6				

Table 11. (cont'd.)

Inbred tested	Root lodged			Broken plants			Strong stalks Lanstr.
	N. J.	Palmyra plants	Lehigh plants	N. J.	Palmyra	Lehigh Lanstr.	
	angle	%	%	%	%	%	%
Pa. 415	27	0	43	88	7	27	62
Pa. 887P	50	7	77	83	7	7	91
Pa. 419	18	0	58	95	15	12	76
Pa. 886P	52	0	42	88	33	33	47
Pa. 91	47	0	25	42	0	3	81
CI 317B	40	0	80	82	13	16	78
H49	45	0	41	88	20	6	70
L317	12	0	72	91	40	17	59
Pa. 890P	25	0	74	86	40	12	75
Ind. 38-11R	33	0	75	82	7	12	77
Oh 7A	55	0	65	70	20	12	54
Pa. 92	12	0	46	65	13	8	82
Ill. Hy	35	0	58	92	27	18	63
Oh 7B	35	0	76	89	13	6	60
Pa. 431P	30	7	35	91	73	22	57
Pa. 83	25	0	60	89	33	15	54
Pa. 418	45	0	50	85	47	14	60
Pa. 416	40	0	50	90	53	22	73
Oh 41	12	0	67	95	60	15	56
CI 42A	23	0	48	78	15	12	69
Pa. 57	18	13	22	98	53	30	38
CI 38B	22	0	49	92	27	12	70
Oh 07	52	0	50	73	15	13	84
Pa. 429P	18	0	22	100	47	30	26
Pa. 94	38	0	35	84	15	19	58
Wf9	33	7	49	80	13	7	50
Pa. 93	20	0	28	90	47	19	40
Pa. 430P	8	0	58	92	27	20	55
Pa. 424P	10	0	20	94	87	30	36
Pa. 772	35	0	23	84	7	15	78
Pa. 425P	30	0	48	89	67	29	22
Pa. 426P	25	0	21	92	53	22	44
Pa. 427P	18	0	51	92	60	18	26
Pa. 896P	13	0	29	90	20	21	69
Pa. 432P	15	0	38	90	20	15	38
Pa. 428P	25	0	44	92	--	24	59
Conn. 845			54				66

Table 11. (cont'd.)

Inbred tested	Smut Lehigh	Rating for leaf blight		Days to mid-silk	
		Lehigh Lanstr.	Palmyra	Lehigh Lanstr.	Palmyra
	%	1-5	1-5		
Pa. 415	2	2.9	2.0	81.4	70
Pa. 887P	0	1.4	2.0	82.7	70
Pa. 419	2	1.5	1.5	85.3	75
Pa. 886P	11	2.5	1.5	82.8	71
Pa. 91	6	2.6	1.0	83.4	74
CI 317B	9	2.1	1.0	86.9	78
H49	2	2.8	1.5	84.1	74
L317	6	2.8	2.5	84.7	73
Pa. 890P	4	2.7	1.5	85.2	73
Ind. 38-11R	9	2.7	1.5	84.1	75
Oh 7A	0	2.8	1.5	84.7	75
Pa. 92	2	2.8	2.0	80.1	71
Ill. Hy	2	3.4	2.5	82.3	72
Oh 7B	7	3.1	2.0	84.1	71
Pa. 431P	4	2.6	1.5	82.9	72
Pa. 83	2	3.1	2.0	81.0	70
Pa. 418	2	2.6	2.0	82.1	70
Pa. 416	11	2.4	1.5	81.4	70
Oh 41	0	3.3	2.0	82.6	70
CI 42A	2	1.7	2.0	82.6	72
Pa. 57	8	3.5	3.0	79.0	70
CI 38B	9	1.6	1.0	83.1	75
Oh 07	2	2.8	2.0	83.1	72
Pa. 429P	2	3.0	2.0	82.1	72
Pa. 94	6	3.1	2.0	80.9	72
Wf9	2	3.4	2.0	80.6	70
Pa. 93	9	3.5	3.5	80.3	70
Pa. 430P	18	3.0	2.5	82.5	73
Pa. 424P	2	3.6	4.0	80.0	67
Pa. 772	2	3.3	2.5	81.4	71
Pa. 425P	0	3.3	2.5	79.8	69
Pa. 426P	9	2.9	3.0	80.4	70
Pa. 427P	2	2.3	2.0	81.3	72
Pa. 896P	0	2.5	2.0	80.2	70
Pa. 432P	6	3.5	3.0	82.0	73
Pa. 428P	11	2.6	---	83.0	--
Conn. 845	6	2.5	---	85.6	--

REPORT OF THE COMMITTEE ON POLLINATING SUPPLIES

Cooperative purchase of 275,000 ear shoot bags was made in 1960 for eight conference members. These bags were manufactured of 40# Ripco Aqua Wrap sealed with waterproof adhesive throughout. Two sizes were delivered: 2 1/2" x 6 1/2" at a price of \$2.90 per thousand and 3" x 8" at a price of \$3.40 per thousand. The purchase was made from the Carter Paper Company, West Springfield, Massachusetts.

The committee is arranging the cooperative purchase of tassel bags for 1961. Eight conference members have expressed interest.

M. R. Johnson
R. S. Snell
D. L. Matthews, Chairman

REPORT OF THE COMMITTEE ON NOMENCLATURE OF CYTOPLASMIC STERILITY

This committee had no report to give.

REPORT OF THE COMMITTEE ON STALK ROT DISEASES

The cooperative project on stalk rot initiated in 1958 was continued in 1960. Cooperators were N. J. Whitney and C. G. Mortimore, Harrow, Ontario, Canada; R. G. Rothgeb, College Park, Maryland; J. C. Anderson and J. L. Peterson, New Brunswick, New Jersey; C. W. Boothroyd and H. L. Everett, Ithaca, New York and G. W. Gorsline, State College, Pennsylvania. The project was divided into two parts, one a study of stalk standability of selected inbreds and hybrids, the other a pathogenicity test of three isolates of Gibberella zeae in comparable corn lines grown at 3 locations.

Cooperative Stalk Rot Project

Part I. Stalk standability of selected corn inbreds and hybrids.

Procedure

Seed of inbreds selected by the conference members and of single cross hybrids made by Anderson at New Jersey was sent to the above cooperators. Data were obtained on silking date, grain moisture at harvest, stalk rot incidence and yield at harvest of early and late maturity hybrids (Tables 12-18). The yield data in "bu/A" may be somewhat erroneous if compared

between locations. Most of the original data were in "lbs.", and in some instances estimates were made of approximate numbers of plants per acre as a basis for conversion to bu/A. At any one location the data are comparable. Additional data were taken by some members but are not included in this report, e.g., root lodging at New Jersey, and leaf blight at Pennsylvania. Local inbreds and single crosses were added at some of the locations for comparison with those in the test.

All combination single crosses, were made with 4 new inbreds in the early maturity group (J48, Pa.32, W153R, and W37A) plus Oh43 and Oh51A, and with 3 new inbreds in the late group (Pa.70, Pa.881P and WF9) plus Oh07, C103, and 38-11. Seed of these lines will be planted in 1961. All combinations of the above single crosses will again be made for planting and observation in 1962.

Results

a) Data for mid-silk date and grain moisture at harvest for the short season corn lines (Tables 12-13) revealed early maturity at Harrow, Canada, and at College Park, Md., a little later maturity at New Brunswick, N. J., later yet at Centre Hall, Pa., and very late at Ithaca, N. Y. Of the long season entries, those at Landisville, Pa., matured a little earlier than those at College Park and New Brunswick. With the exception of those at Ithaca, all lines matured well within the growing season.

b) There were marked differences in amount of stalk rot between corn lines at all locations (Tables 14-15). However, except for a few inbreds and hybrids in both maturity groups, there were also marked differences in stalk rot of any one corn line grown at several locations.

c) The greatest amount of stalk rot in both maturity groups (Tables 14-15) occurred at New Brunswick, the next highest at Harrow, a moderate amount at College Park, even less at the two locations in Pennsylvania, and least at Ithaca. Inbreds were more heavily rotted than single crosses.

d) Pa.54, and to a less extent Os420, showed poor standability, while Oh26 revealed good standability. (Although standability was good for Oh26 at Harrow it lodged badly because of root rot). The stalk rotting characteristics of these early maturity inbreds carried over to some extent into single crosses involving them. In the late maturity group, Oh07 was quite resistant to rot and Os420 was susceptible. (Tables 14-15).

e) Yields obtained from almost all of the single cross hybrids could be considered excellent (Table 16). Yields of inbreds were less than those of their hybrids, and stalk rot susceptible Pa.54 proved to yield much better than resistant Oh26.

Discussion

In comparing stalk rot severity with maturity of inbreds and hybrids it may be noted that the disease was generally more severe in the early maturity group than in the late group. Also, all corn lines at some locations matured earlier than at other locations. In general, the corn in the earlier maturing plots had the more severe stalk rot. However, corn lines at any one location did not necessarily show this high correlation between early maturity and stalk rot incidence. For example, Pa.54 was somewhat later than Oh26 in maturity, but was much more severely rotted. It would seem that early maturity favors stalk rot development, but that disease severity is determined in large part by innate resistance of the corn line.

Considering the few inbreds and single cross combinations of these inbreds involved, the results to date look promising. Three or four inbreds (Oh26, Oh43, Oh07 and 38-11) expressed resistance to stalk rot in the Northeast and several of the single crosses involving these inbreds looked good. With the exception of the Ithaca area, hybrids of both maturity groups matured within the normal season and yielded well. Performance of extra inbreds and hybrids added by cooperators to the basic groups was generally good, many of them showing stalk rot resistance and high yielding potential. This type of experimentation in a search for new and better germ plasm for resistance to stalk rot should be continued.

Part II. Pathogenicity test of three *Gibberella zeae* isolates.

Procedure

Gibberella zeae isolates furnished by N. J. Whitney at Harrow, Ontario, Canada, by C. W. Boothroyd at Ithaca, New York, and by J. L. Peterson at New Brunswick, New Jersey were grown on toothpicks in potato dextrose broth at Ithaca. These infested toothpicks were used to inoculate comparable lines of corn, one hybrid resistant to stalk rot and one hybrid susceptible to stalk rot under natural conditions being furnished by each of the cooperators for use in each of the three above locations. All hybrids were inoculated at approximately the full silk stage. Plants at Ithaca and New Brunswick were cut for rot readings 5 weeks after inoculation, those at Harrow 6-1/2 weeks later. Percentages of rot in inoculated internodes, calculated from visual estimates (0 = no rot, 0.5 = 12.5% rot, 1.0 = 25% rot4 = 100% rot), are given in Table 19. The average amount of rot induced by each of the three isolates at each location, and for all isolates in any one corn hybrid at each location are given in Table 20. Also in Table 20 are stalk rot figures for infection occurring under natural field conditions for the same hybrids.

Results

a) The three isolates of *Gibberella* used in this test were of comparable virulence (table 19).

b) The amount of rot induced by all three isolates in corn at New Brunswick was less than that at the other two locations (table 19).

c) The amount of rot induced artificially was comparable in both resistant and susceptible hybrids from Canada and New Jersey when these hybrids were tested at Harrow and at New Brunswick; that in the same hybrids at Ithaca was greater in the resistant than in the susceptible lines (table 19).

d) The amount of rot induced artificially by all isolates at all locations in the resistant hybrid from New York was less than that in the susceptible hybrid from Ithaca (table 19).

e) In the two locations where stalk rot developed under natural field conditions, the resistant hybrids furnished by all three cooperators proved to be quite resistant, while the susceptible hybrids showed considerable rot (table 20).

Discussion

Under the conditions of this experiment, only one of the three pairs of resistant and susceptible hybrids indicated any apparent correlation between artificial and natural infection. This discrepancy tends to minimize the value of artificial inoculation as a single tool for stalk rot evaluation. However, the existence of a high correlation between artificial and natural infection in the one pair of hybrids suggests an inherent biochemical resistance to stalk rot and indicates justification for using artificial inoculation as a technique in the study of the nature or resistance.

The high degree of virulence of three isolates of *Gibberella zeae* from widely separated locations in the Northeast reveals the widespread potential of this fungus as a possible cause of stalk rot of corn in this area.

All corn hybrids grown at Ithaca were very late in maturing and failed to show any stalk rot. The consistent differences in the amount of naturally-occurring stalk rot between resistant and susceptible field-tested hybrids in the other two locations reaffirms the general observation that resistant germ plasm is present in some hybrids and lacking or obscured in others. Further search for better sources of resistance to stalk rot seem justifiable.

Proposed Cooperative Regional Project

It was the unanimous opinion of the committee that a Cooperative Regional Project on Stalk Rot should be initiated. It was agreed in principle that emphasis of the cooperators should be directed toward the physiology of the corn plant as related to the stalk rot diseases.

J. C. Anderson
J. L. Peterson
C. C. Wernham
N. J. Whitney
C. W. Boothroyd, Chairman

Table 12. Days to mid-silk and grain moisture at harvest of early maturity corn lines.

[illegible]

Table 13. Days to mid-silk and grain moisture at harvest of late maturity corn lines.

LATE GROUP ENTRY	COLLEGE PARK, MD.		N. BRUNSWICK, N. J.		LANDISVILLE, PA.		Av. of all locations	
	Mid- silk	% H ₂ O	Mid- silk	% H ₂ O	Mid- silk	% H ₂ O	Mid- silk	% H ₂ O
<u>Inbred</u>								
Oh07	82	26	-	-	91	20	87	23
C103	79	25	-	-	96	27	88	26
Oh43	78	24	-	-	85	24	82	24
L317	90	-	-	-	98	26	88	-
38-11	85	29	-	-	93	19	89	24
Os420	78	17	-	-	91	18	85	18
J47	-	-	-	-	-	-	-	-
JPa70	-	-	-	-	-	-	-	-
Pa83	-	-	-	-	95	21	-	-
Pa70	-	-	-	-	92	24	-	-
<u>Single Cross</u>								
Oh07xC103	72	27	-	27	87	24	80	26
" xOh43	72	26	-	21	79	22	76	23
" xL317	76	27	-	26	85	21	81	25
" x38-11	77	23	-	26	87	21	82	23
" xOs420	74	25	-	26	82	21	78	24
C103xOh43	72	25	-	27	81	22	77	25
" xL317	72	30	-	30	86	26	79	29
" x38-11	74	24	-	27	84	22	79	24
" xOs420	71	27	-	31	81	25	76	28
Oh43xL317	73	27	-	28	82	24	78	26
" x38-11	74	23	-	24	80	21	77	23
" xOs420	70	29	-	23	78	23	74	25
L317x38-11	80	24	-	25	85	21	83	23
" xOs420	75	30	-	28	82	24	79	27
38-11xOs420	75	23	-	26	82	21	79	23
C103xJ47	-	-	-	30	-	-	-	-
Pa83xPa70	-	-	-	-	84	24	-	-

Table 14. Stalk rot in early maturity corn lines.

EARLY GROUP	PERCENTAGE BROKEN PLANTS (STALK ROT)				
	Harrow, Ont. Can.	College Park Md.	N.Brunswick N.J.	Ithaca N.Y.	Centre Hall Pa.
Inbred					
Pa54	91%	54%	95%	57%	88%
Os420	85	26	83	41	44
Oh43	93	20	13	2	0
A401	100	37	27	0	3
Oh51A	93	70	32	17	0
Oh26	14	26	11	2	6
B14	0	-	-	-	-
CH9	21	-	-	-	-
JW22	-	-	13	-	-
J48	-	-	4	-	-
NY703	-	-	-	41	-
NY821	-	-	-	28	-
Pa32	-	-	-	-	28
PaB8B	-	-	-	-	12
Single Cross					
Pa54xOh51A	60	17	41	0	0
" xOs420	94	35	95	0	31
" xOh43	43	39	99	0	22
" xA401	88	60	86	0	16
" xOh26	12	31	93	0	6
Oh51AxOs420	63	17	34	0	0
" xOh43	39	31	87	0	0
" xA401	68	43	84	0	3
" xOh26	17	5	36	0	6
Os420xOh43	44	26	85	0	16
" xA401	62	33	89	0	25
" xOh26	20	9	67	0	16
Oh43xA401	48	26	86	0	0
" xOh26	25	21	40	0	0
A401xOh26	30	38	45	0	9
B14xCH9	3	-	-	-	-
J48xOh51A	-	-	31	-	-
Oh51xD4	-	-	-	0	-
Oh43xPa32	-	-	-	-	3

Table 15. Stalk rot in late maturity corn lines.

LATE GROUP ENTRY	PERCENTAGE	BROKEN PLANTS (STALK ROT)			Av. of all locations
	College Park, Md.	N. Brunswick, N. J.	Landisville, Pa.		
<u>Inbred</u>					
Oh07	3%	10%	3%	5%	
C103	4	40	0	15	
Oh43	25	7	9	14	
L317	0	56	34	30	
38-11	2	27	4	11	
Os420	34	78	34	49	

J47	-	5	-	-	
JPa70	-	35	-	-	

Pa83	-	-	6	-	
Pa70	-	-	0	-	
<u>Single Cross</u>					
Oh07xC103	29	91	0	40	
" xOh43	1	74	3	26	
" xL317	13	84	3	33	
" x38-11	14	81	3	33	
" xOs420	1	80	9	30	

C103xOh43	52	83	0	45	
" xL317	25	86	12	41	
" x38-11	26	80	3	41	
" xOs420	25	86	0	37	

Oh43xL317	22	86	9	39	
" x38-11	23	76	9	36	
" xOs420	5	84	3	31	

L317x38-11	18	56	28	34	
" xOs420	21	100	25	49	

38-11xOs420	7	84	16	36	

C103xJ47	-	63	-	-	

Pa83xPa70	-	-	0	-	

Table 16. Yield of grain of early maturity corn lines.

EARLY GROUP ENTRY	YIELD OF DRY SHELLLED GRAIN (15% MOISTURE)				
	Harrow, Ont. Can.	College Park, Md.	N. Brunswick, N. J.	Ithaca, N. Y.	Centre Hall, Pa.
<u>Inbred</u>					
Pa54	64 bu/A	43 bu/A	- bu/A	47 bu/A	60 bu/A
Os420	55	23	-	31	39
Oh43	60	43	-	47	42
A401	47	35	-	34	48
Oh51A	45	40	-	35	41
Oh26	38	28	-	26	29
B14	18	-	-	-	-
CH9	40	-	-	-	-
JW22	-	-	-	-	-
J48	-	-	-	-	-
NY703	-	-	-	22	-
NY821	-	-	-	54	-
Pa32	-	-	-	-	24
Pa88B	-	-	-	-	19
<u>Single Cross</u>					
Pa54xOh51A	93	98	85	97	129
" xOs420	105	113	73	116	147
" xOh43	108	105	65	125	147
" xA401	98	93	68	93	132
" xOh26	98	75	68	107	132
Oh51AxOs420	115	115	106	115	145
" xOh43	98	115	82	114	142
" xA401	108	90	84	102	124
" xOh26	85	90	83	102	136
Os420xOh43	117	110	83	116	140
" xA401	112	103	85	126	115
" xOh26	111	98	83	116	139
Oh43xA401	101	90	79	102	146
" xOh26	100	98	91	121	142
A401xOh26	95	85	74	107	130
B14xCH9	118	-	-	-	-
J48xOh51A	-	-	112	-	-
Oh51xD4	-	-	-	110	-
Oh43xPa32	-	-	-	-	115

Table 17. Yield of grain of late maturity corn lines.

LATE GROUP ENTRY	YIELD OF DRY SHELLLED GRAIN (15% MOISTURE)			
	College Park, Md.	N. Brunswick, N. J.	Landisville, Pa.	Av. of all locations
<u>Inbred</u>				
Oh07	48 bu/A	- bu/A	38 bu/A	43 bu/A
C103	40	-	29	35
Oh43	43	-	41	42
L317	13	-	16	15
38-11	43	-	37	40
Os420	28	-	16	22

J47	-	-	-	-
JPa70	-	-	-	-

Pa83	-	-	31	-
Pa70	-	-	52	-
<u>Single Cross</u>				
Oh07xC103	128	108	158	131
" xOh43	113	91	138	114
" xL317	105	103	160	123
" x38-11	113	104	150	122
" xOs420	120	102	146	123

C103xOh43	125	90	159	125
" xL317	120	92	171	128
" x38-11	98	97	141	112
" xOs420	140	104	155	133

Oh43xL317	105	92	140	112
" x38-11	118	105	161	128
" xOs420	78	86	124	96

L317x38-11	120	107	142	123
" xOs420	100	103	139	114

38-11xOs420	125	105	128	119

C103xJ47	-	131	-	-

Pa83xPa70	-	-	131	-

Table 18. Summary of data from Cooperative Corn Stalk Rot Project. Northeastern Corn Improvement Conference, 1960.

EARLY GROUP ENTRY	Averages of data from Harrow, Canada, College Park, Md., New Brunswick, N. J., Ithaca, N. Y., and Centre Hall Pa.			
	Days to mid-silk	Grain moisture	Stalk rot percentage	Yield dry grain in bu/A
<u>Inbred</u>				
Pa54	82	28%	77%	54
Os420	87	32	56	37
Oh43	83	32	26	48
A401	81	29	34	41
Oh51A	81	28	42	40
Oh26	83	29	12	30
<u>Single Cross</u>				
Pa54xOh51A	74	24	23	100
" xOs420	77	28	51	111
" xOh43	75	27	41	110
" xA401	75	23	50	97
" xOh26	75	24	29	100
Oh51AxOs420	76	27	23	119
" xOh43	75	25	32	110
" xA401	74	24	40	102
" xOh26	75	25	15	99
Os420xOh43	78	29	34	113
" xA401	77	27	42	108
" xOh26	77	28	23	109
Oh43xA401	76	26	32	104
" xOh26	77	26	19	110
A401xOh26	75	-	15	98

Table 19. Amount of stalk rot induced artificially in comparable corn lines at three locations.

ENTRY	Percentage Stalk Rot - Artificial Inoculation								
	Can. Gibberella			N. J. Gibberella			N. Y. Gibberella		
	at	at	at	at	at	at	at	at	at
	Harrow	N.Bruns.	Ithaca	Harrow	N.Bruns.	Ithaca	Harrow	N.Bruns.	Ithaca
<u>CANADA</u>									
Harrow 581 (R)	66%	33%	69%	72%	28%	48%	72%	30%	62%
DeKalb 240 (S)	60	38	54	64	25	52	63	33	49

<u>NEW JERSEY</u>									
J48xOh51A (R)	45	23	78	38	15	68	47	18	79
Os420xOh43 (S)	50	25	51	45	20	45	56	20	60

<u>NEW YORK</u>									
Robson 320 (R)	32	18	41	36	15	46	32	18	54
Funk G10 (S)	58	43	54	46	30	51	53	33	65

Table 20. Averages of stalk rot data from corn inoculated artificially and infected naturally. Cooperative Pathogenicity Test, Northeastern Corn Improvement Conference, 1960.

ENTRY	PERCENTAGE STALK ROT							
	Artificial Inoculation (3 Gib. Strains)				Natural Infection			
	at	at	at	all	at	at	at	all
	Harrow	N.Bruns.	Ithaca	locations	Harrow	N.Bruns.	Ithaca	locations
<u>CANADA</u>								
Harrow 581 (R)	70%	30%	60%	53%	59%	40%	0%	49%
DeKalb 240 (S)	62	32	52	49	87	89	0	88

<u>NEW JERSEY</u>								
J48xOh51A (R)	43	19	75	46	45	19	0	32
Os420xOh43 (S)	50	22	52	41	98	80	0	89

<u>NEW YORK</u>								
Robson 320 (R)	33	17	47	32	58	57	0	58
Funk G10 (S)	52	35	57	48	93	74	0	84

REPORT OF THE COMMITTEE ON THE PRESERVATION OF OPEN- POLLINATED VARIETIES

This committee had no report to give.

REPORT OF THE COMMITTEE ON INBRED RELEASE POLICY

Previously established policies appear to be fulfilling current needs. No immediate change in policies is contemplated.

D. Butler
H. L. Everett
G. Gorsline
D. L. Matthews
W. I. Thomas
J. C. Anderson, Chairman

REPORT OF THE COMMITTEE ON CORN SILAGE RESEARCH

The following several types of research are included in the corn silage work conducted in 1960 or contemplated in 1961.

1. Evaluation of varieties as silage, within maturity groupings.
2. Management for optimum production - population studies, fertilizer trts., drill vs. row planting, time of harvest, etc.
3. Silage values of different parts of the corn plant - including a comparison of corn "hay" vs. well-eared silage.
4. Comparisons of types of corn - high oil, high sugar.
5. Comparison of silage potential of corn vs. other annual grasses.
6. Evaluation of the artificial rumen as a technique for evaluating corn silage.

The committee felt that individual stations should continue to pursue in the 1961 crop year the type of research which their interests and the facilities available to them made advisable. Standard hybrids will be included in all types of trials within broad maturity groupings to serve as a basis for comparison.

The general plans of stations intending to conduct silage research in 1961 are as follows:

Ottawa: silage evaluation of three maturity groupings. Ear and stalk will be analyzed chemically.

Eastern States Farmer's Exchange - silage valuation of two maturity groupings.

Pennsylvania - 2 or more varieties at 5 populations and 2 or 3 dates of harvest. Chemical evaluation of single crosses. Study of leaf area as an indicator of silage potential. Feeding value of high oil corn.

West Virginia - adaptation of the artificial rumen technique of forage evaluation to corn silage.

New York - yield evaluation of a variety - population - date of harvest study, plus feeding trials of certain entries. Species comparisons involving corn, sorghum, millets, sudan hybrids, and oats.

New Jersey - evaluation of sterile varieties as silage, including population and time of harvest studies.

MacDonald College - investigation of flint-dent crosses.

Connecticut - studies of high sugar corns.

Submitted to the conference by:

C. E. Manchester
F. Dimmock
M. W. Johnson
W. I. Thomas
R. E. Anderson, Chairman

It was MOVED by W. I. Thomas and seconded by J. C. Anderson that representatives of this committee prepare a project on evaluation of silage, with special emphasis on corn, to be submitted to Director H. R. Fortmann for consideration by the Northeast Directors at their August 1961 meeting.

Motion passed.

It was MOVED by W. I. Thomas, seconded by G. Gorsline that the 1962 Northeastern Corn Improvement Conference be held in New York City on February 23 and 24.

Motion passed.

The nominating committee submitted the name of Dr. Dan Butler as vice-chairman for 1962. There being no other nominations the secretary was instructed to cast a unanimous ballot for Dr. Butler.

It was MOVED by R. I. Brawn that this conference recognize the pending retirement of Chairman F. Dimmock, and express to him the appreciation of the conference for his contributions through the years and our hopes for his continued good health and happiness. The motion was seconded and passed.

W. I. Thomas announced the death of former conference member L. L. Huber. The following is presented as an acknowledgement for his contributions.

Dr. L. L. Huber, a former participant of the N.E.C.I.C., died of a heart attack on August 16, 1960 in Ada, Ohio. Dr. Huber retired as a Professor of Agronomy from the Pennsylvania State University on July 1, 1958, where he had served since 1943. Prior to coming to Penn State University, Dr. Huber was on the staff of the Ohio State University. Since retirement at Penn State University, he has been Professor of Biology at the University of Northern Ohio. He is best known for his work on corn insects and the development of corn hybrids for Pennsylvania. Dr. Huber also had an interest and published articles concerning the ecology of corn. Friends of Dr. Huber have established a memorial in his honor at the Pennsylvania State University.

The meeting adjourned at 12:00 noon.

OFFICERS AND COMMITTEE MEMBERS, 1961-62

Administrative Advisor

H. R. Fortmann

Executive Committee

H. T. Stinson, Chairman
Dan Butler, Vice-chairman
F. Dimmock

Committee on Registration of NE Hybrids

R. G. Rothgeb, Chairman
W. I. Thomas
G. Gorsline
D. Butler
J. C. Anderson

Committee on Uniform Tests of 100-200 Maturity

W. I. Thomas, Chairman
R. M. Bailey
R. I. Brawn
L. S. Donovan
H. L. Everett

Committee on Uniform Tests of 300-500 Maturity

G. Gorsline, Chairman
C. E. Manchester
H. M. Yegian

Committee on Uniform Tests of 600-700 Maturity

D. Butler, Chairman
H. T. Stinson
G. Gorsline

Committee on Uniform Tests of 800-900 Maturity

J. C. Anderson, Chairman
R. G. Rothgeb
W. I. Thomas

Committee on Pollinating Supplies

D. L. Matthews, Chairman
R. S. Snell
M. W. Johnson

Committee on Nomenclature of Cytoplasmic Sterility

H. T. Stinson, Chairman
R. S. Snell
H. L. Everett

Committee on Stalk Rot Diseases

C. W. Boothroyd, Chairman
J. C. Anderson
M. W. Johnson
J. L. Peterson
R. G. Rothgeb
C. C. Wernham

Committee on Preservation of Open-Pollinated Varieties

R. M. Bailey, Chairman

Committee on Inbred Release Policy

J. C. Anderson, Chairman
D. L. Matthews
H. L. Everett
W. I. Thomas

Committee on Corn Silage

R. Anderson, Chairman
L. S. Donovan
C. E. Manchester
M. W. Johnson
W. I. Thomas

ROSTER OF ATTENDANCE

Canada

Brawn, R. I.	MacDonald College	Quebec
Dimmock, F.	Central Expt. Farm	Ottawa

Connecticut

Stinson, H. T., Jr.	Agric. Expt. Station	New Haven
Jones, D. F.	"	"

Delaware

Cole, Dick	Agric. Expt. Station	Newark
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Maine

Bailey, R. M.	University of Maine	Orono
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Maryland

Rothgeb, R. G.	University of Maryland	College Park
Sprague, G. F.	ARS, U.S.Dept. of Agric.	Beltsville

Massachusetts

Yegian, H. M.	University of Massachusetts	Amherst
*Manchester, C. E.	Eastern States Farm. Exchg.	W. Springfield
*Matthews, D. L.	" " "	"

New Jersey

Anderson, J. C.	Rutgers University	New Brunswick
Funk, Reed	" "	"
Peterson, J. L.	" "	"

New York

Anderson, R. E.	Cornell University	Ithaca
Boothroyd, C. W.	" "	"
Jooste, W.	" "	"
Lui, H. Z.	" "	"
Miller, B.	" "	"
Pardee, W. D.	" "	"
Thompson, J. C.	" "	"
Wheeler, D. A.	" "	"

Pennsylvania

*Butler, D.	Eastern States Farm. Exchg.	Palmyra
Creech, R. G.	Penn State University	Univ. Park
Fortmann, H. R.	"	"
Gorsline, G.	"	"
Thomas, W. I.	"	"
Wernham, C. C.	"	"

West Virginia

Johnson, M. W.	Univ. of West Virginia	Morgantown
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* Representatives of the Cooperative Corn Research Project, jointly supported by Eastern States Farmers' Exchange (West Springfield, Mass.) Farm Bureau Cooperative Ass'n. (Columbus, Ohio), Pennsylvania Farm Bureau Cooperative Ass'n. (Harrisburg, Pa.) and administered by Eastern States.

